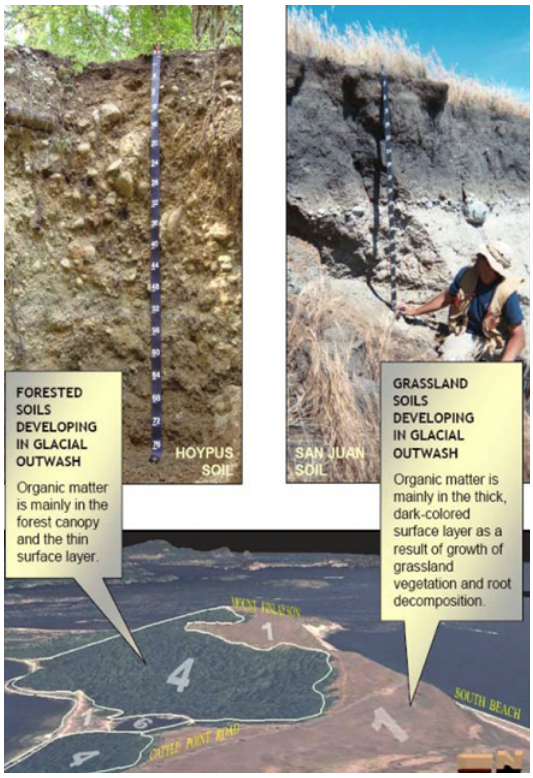
SOIL ORGANIC CARBON: AN ECOLOGICAL THUMBPRINT

The San Juan soil series is an example of a native prairie soil with relatively high amounts of organic carbon within the soil profile. Prairie vegetation is naturally incorporated into the soil profile year after year, creating a zone that is enriched in carbon and visually striking for its dark color. Carbon stored in a soil profile naturally improves soil health, productivity, and stability as well as enhancing water quality.

The Hoypus soil series is an example of a native forest soil with the majority of its organic carbon stored at the top of the soil profile in the forest litter layer. Although visually much different than the San Juan soil, the Hoypus soil shares nearly identical physical properties and serves an equally important ecological role. Although these two soils have formed under different vegetative cover, they have both formed in the sand and gravel of glacial outwash.



Pictured above, an oblique aerial view of Mount Finlayson illustrating where the Hoypus and San Juan soil series are mapped adjacent to each other, distinguished by vegetative cover. Numbers on the map correspond to general soil map unit numbers found in the Soil Survey of San Juan Island National Historical Park.

SAN JUAN SERIES

The San Juan series consists of very deep, somewhat excessively drained soils formed in eolian sands over glacial outwash. San Juan soils are on dunes, hillslopes, and glacial outwash plains with slopes of 0 to 60 percent. Average annual precipitation is about 20 inches and average annual air temperature is about 50 degrees F.

TAXONOMIC CLASS: Sandy, isotic, mesic Pachic Ultic Haploxerolls

TYPICAL PEDON: San Juan sandy loam rangeland, on a south facing glacial outwash plain with a slope of 3 percent and elevation of 65 feet. When described on October 22, 2003 the soil was moist to 10 inches and dry below. Colors are for moist soil unless otherwise noted.

A1 - 0 to 4 inches; black (10YR 2/1) sandy loam, dark gray (10YR 4/1) dry; weak fine granular structure; soft, very friable, non-sticky and non-plastic; many very fine and fine roots; many very fine and fine irregular pores; strongly acid (pH 5.1); abrupt smooth boundary. (4 to 8 inches thick)

A2 - 4 to 13 inches; black (10YR 2/1) sandy loam, dark gray (10YR 4/1) dry; moderate medium subangular blocky structure; soft, very friable, non-sticky and non-plastic; many very fine and fine roots; many very fine and fine irregular pores; 5 percent fine gravel; moderately acid (pH 5.8); abrupt smooth boundary. (8 to 12 inches thick)

A3 - 13 to 19 inches; black (10YR 2/1) sandy loam, dark

gray (10YR 4/1) dry; moderate medium subangular blocky structure; soft, very friable, non-sticky and non-plastic; common very fine and fine roots; many very fine and fine irregular pores; 5 percent fine gravel; slightly acid (pH 6.4); clear wavy boundary. (6 to 10 inches thick).

Bw - 19 to 27 inches; very dark brown (10YR 2/2) gravelly loamy coarse sand, brown (10YR 4/3) dry; weak medium subangular blocky structure; soft, very friable, non-sticky and non-plastic; few very fine roots; many very fine and fine interstitial pores; 30 percent gravel; slightly acid (pH 6.5); clear wavy boundary. (4 to 10 inches thick)

C1 - 27 to 41 inches; very gravelly coarse sand, variegated parent material colors; single grain; loose, non-sticky and non-plastic; few very fine roots; many very fine and fine interstitial pores; 55 percent gravel; neutral (pH 6.8); clear wavy boundary. (4 to 18 inches thick)

C2 - 41 to 62 inches; extremely gravelly coarse sand, variegated parent material colors; single grain; loose, non-sticky and non-plastic; many very fine and fine interstitial pores; 75 percent gravel and 5 percent cobbles; neutral (pH 6.7); clear wavy boundary. (4 to 24 inches thick)

C3 - 62 to 70 inches; extremely gravelly coarse sand, variegated parent material colors; single grain; loose, non-sticky and non-plastic; many very fine and fine interstitial pores; 75 percent gravel; neutral (pH 6.9). (0 to 12 inches thick)

RANGE IN CHARACTERISTICS: Average annual soil temperature 50 to 54 degrees F.

Soil moisture control section - dry 75 to 90 days following summer solstice

Mollic epipedon thickness - 20 to 32 inches

Volcanic glass - less than 5 percent throughout

Particle size control section:

Clay Content - 0 to 12 percent

Rock fragments - 0 to 35 percent in the A2 and A3 horizons, 15 to 60 percent in the Bw horizon, and 35 to 85 percent in the C horizons with a weighted average between 15 and 35 percent

A1 horizon

Clay content - 5 to 12 percent

Rock fragments - 0 to 15 percent gravel

A2 and A3 horizons

Texture - SL, L, or LS

Clay content - 2 to 12 percent

Rock fragments - 0 to 35 percent gravel, 0 to 5 percent cobbles, 0 to 35 percent total

Bw horizon

Texture - LCOS, SL, or LS

Clay content - 0 to 8 percent

Rock fragments - 15 to 60 percent gravel, 0 to 5 percent cobbles, 15 to 60 percent total

C horizons

Texture - COS, LS, or LCOS

Clay content - 0 to 5 percent

Rock fragments - 35 to 80 percent gravel, 0 to 15 percent cobbles, 35 to 85 percent total

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Somewhat excessively drained. Saturated hydraulic conductivity is high to very high through the profile.

USE AND VEGETATION: Mainly used for wildlife habitat. Potential natural vegetation may include an over story of scattered Oregon white oak and Douglas-fir but is primarily prairie vegetation including Roemers fescue, western brackenfern, baldhip rose, common snowberry, and trailing blackberry.

SERIES ESTABLISHED: 1910 Reconnaissance survey of the western part of Puget Sound Basin, Washington.

REMARKS: Diagnostic horizons and features recognized in this pedon include: Mollic epipedon - 0 to 27 inches (A1, A2, A3, and Bw horizons). Particle-size control section - the zone from 10 to 40 inches

ADDITIONAL DATA: Characterization pedon sampled at the type location, NSSL pedon number 04N0409. Reference sample, NSSL pedon number 03N0239

More information on the San Juan soil series and soil surveys around the United States can be found at: http://soils.usda.gov/

A WIDE VARIETY OF SOILS AT SAN JUAN ISLAND NATIONAL HISTORICAL PARK

A journey north to English Camp provides a chance to examine an entirely different soil-landscape regime. Many of the soils at English Camp, such as the Doebay soil, have formed over bedrock in glacial sediments and colluvium. Other soils, such as the Mitchellbay soil, have formed in the presence of a seasonal perched water table. As a result, the plant communities at English Camp differ greatly from those at American Camp. Some soils, such as the Hiddenridge soil, formed under native prairie vegetation similar to that found on the San Juan soil. Both soils resemble each other in appearance. However, the Hiddenridge soil is typically less than 60 inches deep and has a higher water holding capacity.

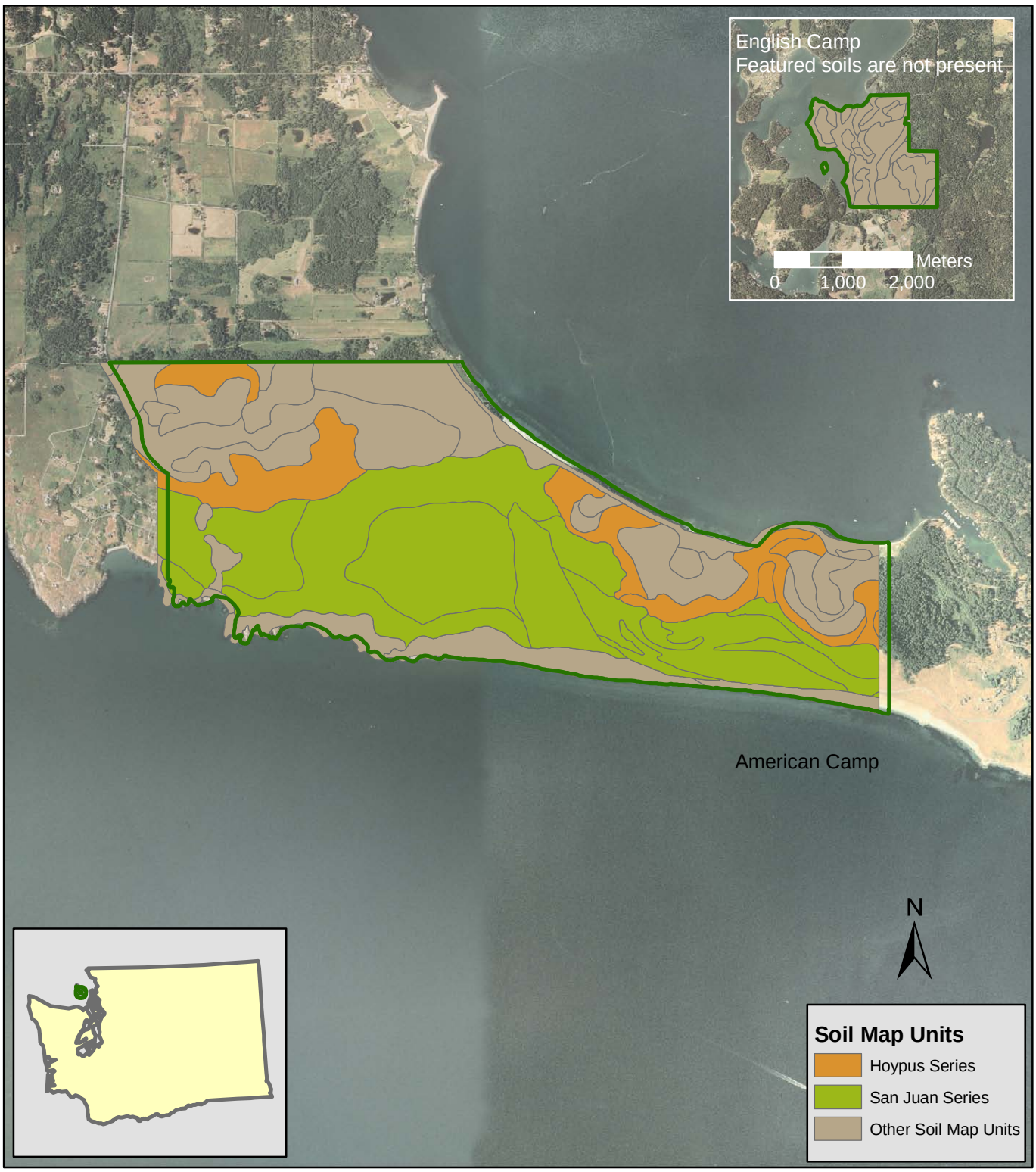
Two factors influencing soil development in some areas of American Camp are biologic activity (rabbit burrowing) and wind erosion/deposition. In the bottom left photograph can be seen numerous rabbit burrows and the resulting scattering of rock fragments at the soil surface. These rock fragments were brought up from deep within the soil profile and effectively change the surface texture and water holding capacity. In the photo at right is an example of a San Juan soil that has been buried over time by advancing wind blown (eolian) sands.

Hoypus and San Juan Series Soils Extent

San Juan National Historical Park, WA

National Park Service
U.S. Department of the Interior

Inventory & Monitoring Program
Soil Resource Inventory



Meters
0 500 1,000 2,000

Source: NRCS Soil Survey, SSA Boundary (Dec 08) and ESRI Data
POC: Soil Resources Inventory Program - Geologic Resources Division
File Name: SAJH_Soil_SoiloftheMonth_201002.mxd
Date: 12 Feb 2010

Scale 1:32,000

Coordinate System - UTM_Zone 10N_NAD 83